

REMARKS

The Official Action mailed March 1, 2004, has been received and its contents carefully noted. This response is filed within three months of the mailing date of the Official Action and therefore is believed to be timely without extension of time. Accordingly, the Applicants respectfully submit that this response is being timely filed.

The Applicants note with appreciation the consideration of the Information Disclosure Statements filed on July 12, 2000, and July 8, 2002.

Claims 20-24 are pending in the present application, of which claims 20 and 24 are independent. Independent claims 20 and 24 has been amended to better recite the features of the present invention and dependent claim 22 has been amended in response to an objection by the Examiner. For the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

Paragraph 5 of the Official Action objects to claim 22 asserting that the claim is vague, confusing, and indefinite for various reasons. In response, claim 22 has been amended to recite "a column of hologram patterns in said hologram member is arranged along a direction of a longer axis of an ellipsoidal spot area in a far field of said real laser light source" which is supported in the specification at page 6, line 12 to page 7, line 17. The Applicants respectfully submit that claim 22 is definite as amended. Accordingly, reconsideration and withdrawal of the objections are in order and respectfully requested.

Paragraph 6 of the Official Action rejects claims 20, 22 and 23 as obvious based on the combination of U.S. Patent No. 5,828,643 to Takeda et al. and U.S. Patent No. 5,696,750 to Katayama. Paragraph 7 of the Official Action rejects claim 21 as obvious based on the combination of Takeda, Katayama, and U.S. Patent No. 5,422,753 to Harris. The Applicants respectfully submit that a *prima facie* case of obviousness cannot be maintained against the independent claims of the present invention, as amended.

As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The prior art, either alone or in combination, does not teach or suggest all the features of independent claim 20, as amended. Independent claim 20 has been amended to recite, among other features, that an aberration, including a sub aberration caused upon diffraction in forming imaginary laser light sources, is canceled so that a diameter of each of a plurality of light spots is diminished. Takeda, Katayama and Harris do not teach or suggest at least the above-referenced features of the present invention.

Some of the problems with conventional optical pickup devices are described in the specification at page 2, line 4, to page 3, line 2, and Figures 7-9 as follows:

With the method illustrated in Fig. 8, a single semiconductor laser 10 is used. Light emitted from a real laser light source 11 ("real" is used to distinguish from "imaginary" laser light sources 12a, 12b, and 12c to be later described) of the semiconductor laser 10 is divided by a diffraction grating 64 into a plurality of light fluxes which serve as those emitted from

the light sources 61a, 61b, 61c, and 61d of the semiconductor laser array 60 shown in Fig. 7 ... Although only a single semiconductor laser can be used with the diffraction grating 64 and manufacture cost can be lowered, it is necessary to mount the diffraction grating 64 at the position as near to the semiconductor laser as possible in order to make compact the optical pickup device. In this case, as shown in Fig. 9, the nearer to the semiconductor laser the diffraction grating is mounted, the larger the angle θ between the light beam incident upon the diffraction grating 64 from the real laser light source 11 and the diffraction light beam emitted from the diffraction grating 64 ($\theta_1 > \theta_2$). Therefore, astigmatism and coma of a light spot become large, which make the diameters of light spots 25a, 25b, and 25c larger and increase jitters in a reproduced signal. (Emphasis added.)

As seen from the above description in the specification, one of the problems which the present invention confronts resides in the occurrence of a sub aberration due to diffraction of light at the hologram member serving to form the imaginary laser light sources. The present invention resolves this problem with the aberration occurring at the hologram member by providing that an aberration, including a sub aberration caused upon diffraction in forming imaginary laser light sources, is canceled so that a diameter of each of a plurality of light spots is diminished.

Takeda, Katayama and Harris do not teach or suggest that aberrations (including aberrations in a holographic member) of a plurality of imaginary laser light sources are canceled so that a diameter of each of a plurality of light spots is diminished. Also, Takeda, Katayama and Harris do not recognize the above-referenced problems of a sub aberration occurring at a hologram member in forming imaginary laser light sources, much less teach a solution to the problems.

Takeda appears to teach "a holographic optical element constructed of a pair of diffraction gratings having different diffractive conditions wherein the element is split into two by a split line near its optical axis as a border and a diffraction generation prevention device for preventing the generation of unwanted diffracted beams from a recording medium" (abstract). The Official Action appears to rely upon virtual images A+, A-, B+, B1 in Takeda for teaching a plurality of imaginary laser light sources. Although Takeda discusses "virtual images A+ and A-" (column 4, line 22), the

Applicants respectfully submit that Takeda does not teach or suggest aberrations of an imaginary laser light source, much less that the hologram/diffraction grating patterns of Takeda are designed to correct such aberrations.

Further, the Official Action concedes that Takeda does not teach "that the hologram/diffraction grating patterns are designed to correct the aberrations of the optical elements in the optical pickup device" (page 3, Paper No. 02122004) and relies on Katayama to cure at least these deficiencies in Takeda.

Katayama appears to teach the following: "In an optical head apparatus for two or more different types of discs, there are provided a first light source for a first wavelength light beam, a second light source for a second wavelength light beam, and an objective lens for leading the first and second wavelength light [beams] to one of the discs. A holographic optical element is provided to converge or diverge only one of the first and second wavelength light beams" (abstract). The technique of Katayama is irrelevant with respect to the formation of an imaginary laser light source. As such, Katayama does not teach or suggest reducing or canceling a sub aberration caused upon diffraction in forming imaginary laser light sources so that a diameter of each of a plurality of light spots is diminished. At best, Katayama appears to teach that the holographic optical element is used to "converge or diverge only one of the first and second wavelength light beams."

Also, it is noted that Katayama appears to teach that the objective lens 6 has a spherical aberration (column 4, line 6). The holographic optical element 5 does not appear to have any aberrations. Therefore, Katayama does not teach or suggest a sub aberration caused upon diffraction in forming imaginary laser light sources or that such aberration is canceled so that a diameter of each of a plurality of light spots is diminished, as required by independent claim 20.

Further, even if motivation were found to combine Takeda and Katayama, it would appear that the resulting device would function to converge or diverge one of first and second wavelength light beams. Specifically, as noted above, the holographic

optical element 5 of Katayama functions to converge or diverge one of first and second wavelength light beams and does not appear to be concerned with canceling an aberration, including a sub aberration caused upon diffraction in forming imaginary laser light sources, so that a diameter of each of a plurality of light spots is diminished.

Harris does not cure the above deficiencies in Takeda and Katayama. Harris is relied upon to allegedly teach elements for controlling scanning beam intensity (page 5, Paper No. 02122004). Takeda, Katayama and Harris, either alone or in combination, do not teach or suggest that an aberration, including a sub aberration caused upon diffraction in forming imaginary laser light sources, is canceled so that a diameter of each of a plurality of light spots is diminished.

Therefore, Takeda, Katayama and Harris do not teach or suggest all the features of independent claim 20. Since Takeda, Katayama and Harris do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained.

Furthermore, there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Takeda and Katayama or to combine reference teachings to achieve the claimed invention.

The Official Action asserts that “[it] would have been obvious to one skilled in the art to apply the teachings of Katayama to modify the holographic optical element of Tanaka et al for the benefit of making the diffracted light beams at [the] optical disk free from aberrations so that [it] reduces the noise in the optical pickup device” (page 4, Paper No. 02122004). The Applicants respectfully disagree and traverse the above assertions in the Official Action.

As noted in detail above, Takeda and Katayama do not teach or suggest aberrations of an imaginary laser light source. Therefore, it is unclear how or why one of ordinary skill in the art would be motivated to apply the teachings of Katayama to Takeda to achieve a device which cancels such aberrations so that a diameter of each of a plurality of light spots is diminished.

Even assuming motivation could be found, the Official Action has not given any indication that one with ordinary skill in the art at the time of the invention would have had a reasonable expectation of success when combining Takeda and Katayama.

The Applicants further contend that even assuming, *arguendo*, that the combination of Takeda and Katayama is proper, there is a lack of suggestion as to why a skilled artisan would use the proposed modifications to achieve the unobvious advantages first recognized by the Applicants. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.

In the present application, it is respectfully submitted that the prior art of record, alone or in combination, does not expressly or impliedly suggest the claimed invention and the Official Action has not presented a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.

For the reasons stated above, the Official Action has not formed a proper *prima facie* case of obviousness. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Paragraph 8 of the Official Action rejects claim 24 as obvious based on U.S. Patent 5,422,753 to Harris. The prior art, either alone or in combination, does not teach or suggest all the features of independent claim 24, as amended. Independent claim 24 has been amended to recite that a hologram member has a hologram pattern which allows distribution of optical intensity within a single light area of a servo light spot to be uniform without unevenness. Harris does not teach or suggest at least the above-referenced features of the present invention.

The Official Action asserts that "Harris teaches that the binary diffractive structure [20] has a relief phase grating structure such that it provides a uniform intensity for the non-diffracted light that forms the light spot" (page 5, Paper No. 02122004). The Applicants respectfully disagree and traverse the above assertions.

Unlike the present invention, Harris appears to be directed to a technique of scanning a light beam on a photoreceptor medium and Harris appears to provide uniform intensity for the scanning beam as described, for example, at column 6, line 62, to column 7, line 6, as follows:

The positions of the scanning beam with the minimum intensity will be minimally diffracted by the surface relief phase grating structure of the binary diffractive optical element while positions of the scanning beam with the maximum intensity will be maximally diffracted by the surface relief phase grating structure of the binary diffractive optical element. ... the surface relief phase grating structures are scaled to the intensity level of the scanning beam ... this matching of intensity level to surface relief phase grating structures provides a uniform lower intensity 74, equal to the intensity at the ends of the scan line 66 and 68.

This is clearly different from the technique of uniform intensity of the light spot, as recited in amended claim 24 of the present invention. In short, Harris's technique aims to reduce the difference in intensity among a plurality of light beams. Whereas, the present invention aims to provide a uniform optical density distribution within an area of a single light spot. As clearly recited in amended claim 24, "the hologram member has a hologram pattern which allows distribution of optical intensity within a single light area of said servo light spot to be uniform without unevenness." Therefore, Harris and the present invention are essentially different from each other.

Further, the Official Action asserts that "Harris teaches ... the light spot" (page 5, Paper No. 02122004, citing column 8 of Harris). The Applicants respectfully disagree and traverse the above assertion in the Official Action. At column 8 of Harris, the term "light spot" is not taught or suggested. Rather, the term "light beam" is used. As such, Harris does not teach or suggest a light spot.

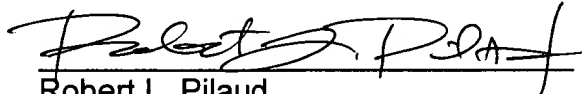
Therefore, Harris does not teach or suggest that a hologram member has a hologram pattern which allows distribution of optical intensity within a single light area of said servo light spot to be uniform without unevenness.

Since Harris does not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and

withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Robert L. Pilaud", written over a horizontal line.

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